

Consideration of Private Events is Required in a Comprehensive Science of Behavior

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Baum (2011) argues that private events “constitute a trivial idea and are irrelevant to accounts of behavior” (p. 185), and that “all the behavior and effects that matter are public” (p. 194). In arguing so, Baum has misunderstood the central purpose of invoking private events. Private events play no role in the experimental analysis of behavior, but they play an important role in the interpretation of behavior outside the laboratory. If we do not engage in such interpretive exercises, we have no explanation at all for much human behavior, and we leave the vacuum to be filled with folk psychology and its derivatives. Skinner’s recognition of the role of private events in a natural science was a necessary step toward a comprehensive account of behavior, but Baum is determined to take that step back. That is a bad idea, and Baum’s reasons for urging it are unsound.

THE ROLE OF INTERPRETATION IN SCIENCE

In his discussion of the role of private events in a natural science, Skinner (1953) proposed that events within the skin are of the same stuff and are to be understood in the same terms as events outside the skin. In arguing so, he was following illustrious precedents: An assumption fundamental to all science is that phenomena outside the compass of our observations obey the same principles as phenomena within it. An explicit statement of the assumption can be

traced at least as far back as Newton (1687/1952), who, in his *Principia*, asserted, as one of his “rules for reasoning” in science, “The qualities of bodies ... found to belong to all bodies within the reach of our experiments are to be esteemed the universal qualities of all bodies whatsoever” (p. 270). The phrase “all bodies,” of course, includes planets, stars, microscopic dust, and myriad other entities undetectable by the tools of the 17th century scientist. Newton was not stating a fact: For all he knew, or anyone knows, the universe beyond our ken obeys different physical laws from those governing the pendulums, balls, prisms, and rotating buckets that served in his experiments. It was an assumption, an assumption of continuity and uniformity in nature, an assumption without which science would be pointless. As Skinner (1963/1969) noted, “When a man tosses a penny into the air, it must be assumed that he tosses the earth beneath him downward. It is quite out of the question to see or measure the effect on the earth, but the effect must be assumed for the sake of a consistent account” (p. 228). Many of nature’s phenomena lie beyond our ability to measure, control, and observe, but science always interprets such phenomena in light of principles derived from observations made under optimal conditions.

The planet Neptune cannot be seen by the naked eye and was thus “private” until the 1840s, when it was first tracked by astronomers with the aid of telescopes. But its existence had been inferred for several decades from observed perturbations in the

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orbit of Uranus. Astronomers had been faced with the choice of doubting their observations, abandoning the assumption of uniformity, discarding established laws of celestial mechanics, or inferring the existence of an unobserved planet. Until Neptune had been systematically observed, it could not contribute to the confirmation of established scientific principles or to the formulation of new ones, but the inference of its existence nevertheless played an important role in science before its discovery: It made sense of all of the available data. It was neither a fact nor an observation, but it permitted the "consistent account" to which Skinner alluded. It permitted scientists to continue to trust the generality of the laws of motion that had served them so well over the preceding two centuries, and it motivated and guided the patient search that finally detected the planet. Moreover, it displaced any tendency to suppose that the motion of Uranus was governed by the whims of the Greek god for whom the planet was named.

Inferences of private behavioral events play an analogous role. They are not data, and they do not participate in the formulation of behavioral principles, but they serve at least four purposes: (a) They permit us to assume the generality of established behavioral principles; (b) they guide future inquiry; (c) they make sense of the fragmentary data we do have about the behavioral world around us; and (d) they displace the tendency to invoke agency, spirits, Greek gods, or the apparatus of folk psychology. As Palmer and Donahoe (1991) suggested, such interpretive exercises are not peripheral to science but central:

It is characteristic of historical sciences, such as evolutionary biology, cosmology, and behavior analysis, that much of the domain is beyond the scope of experimental analysis; we must rely on interpretation for our understanding of phenomena. It is common to suppose that interpretation is a poor cousin

to experimental analysis, something to which we resort because we have nothing better to offer. To the contrary, considering the scope of the two enterprises, experimental analysis is better viewed as the handmaiden of interpretation; we engage in experimental analysis so that we can interpret the world. Our understanding of nature would be slight indeed if it were confined to those phenomena that have been analyzed experimentally. Most of our scientific understanding of the world is interpretation: No one has done an experimental analysis of the tides or of the orbit of planets or of the evolution of the wing, and most of our everyday explanations for the way things work are interpretations, albeit often straightforward ones, based on a few well established physical principles. (p. 225)

Much human behavior would be baffling to us if we refused to consider the role of private events. Consider the following problem: Let each letter equal its ordinal position in the alphabet, so that $A = 1$, $B = 2$, and so on. What is $F + I$? Most people respond correctly, after a pause. But notice that this response is a kind of anomalous "perturbation" in behavior. No stimuli in the current context evoke the target response as the result of a relevant history of reinforcement. We cannot explain the behavior by appealing directly to the subject's history: The question has never been asked before, nor has the response been reinforced in this context. Uranus behaves *as if* it were attracted by an unseen planet; our subject responds *as if* he had been asked, "What is $6 + 9$?" (a question with which he indeed has a relevant history). The astronomer resolves his anomalous data by postulating an unobserved planet, and the behavior analyst resolves his anomalous data by postulating that his subject engages in the unobserved mediating behavior of reciting the alphabet to F and I , respectively, while keeping track of the number of letters named; an exercise that produces the responses 6 and 9. Both accounts might be wrong: Maybe the orbit of Uranus is perturbed by a great intermittent Jovian wind, hitherto unknown. Maybe our subject's behavior is

controlled by a previously unsuspected innate alphabet-tracking device. The virtue of our interpretive exercises is not that they reveal the truth but that they show how the phenomenon in question can be accommodated by the available data in conjunction with established principles. That is, they resolve puzzlement about the world by showing one way that nature might have produced the phenomenon under study without appealing to anything new. This is everyday practice in science.

Should we be sufficiently interested in investigating the matter, our behavioral interpretation will guide relevant work. We can measure response latencies; we can probably measure sequential twitching of our subjects' fingers as they covertly pace their recitation of the alphabet; we can pose interference tasks that might disrupt the performance, such as requiring our subjects to count backwards from 158 by sevens; we can invent novel alphabets in which F and I are closer to or more distant from the first letter; we can loudly recite random letters and numbers into our subject's ears, increasing the likelihood that our subjects will emit mediating behavior at a measurable amplitude. We can record imperceptible movements of the mylohyoid muscle with electromyography. Such steps might put some empirical meat on the interpretive bones of our account. As in any science, interpretations not only resolve mysteries; they can guide research. Thus inferences about private events play an important role in behavior analysis, just as analogous inferences play a role in other sciences.

THERE IS NO SUCH THING AS PRIVACY IN PRINCIPLE

Of course I agree with Baum that behavior analysis must be monistic. Like the assumption of uniformity, monism is an assumption, not a fact,

but it is a necessary assumption, if behavior analysis is to be a science. Moreover, from this assumption, it follows that there can be no such thing as privacy in principle. (By privacy in principle, I mean behavioral events that must, in principle, forever remain hidden, whatever the tools of the scientist.) If the world is made of one stuff, then behavioral phenomena are physical phenomena. If they are physical phenomena, then they must be susceptible to detection in principle (with due recognition of indeterminacy of observation at the subatomic level), however remote from observation they might be in practice or with the technology of the day. As I have pointed out elsewhere (e.g., Palmer, 2009), observability is not a property of a response but of the vantage point and tools of the observer. A deaf and myopic observer will fail to detect behavior easily spotted by a normal observer, and the latter will fail to detect behavior observed by someone equipped with an electromyograph, or other amplifying device. The subject matter remains the same, but whether it is observed (i.e., whether it is private) varies from one observer to another. This point applies up to the limits of instrumental amplification that exist at the time of the observation. Thus, privacy is a circumstantial property of behavior, and we can dismiss privacy in principle from our consideration.

BAUM'S OBJECTIONS TO PRIVACY AS A CIRCUMSTANTIAL PROPERTY OF BEHAVIOR

Although Baum says that a rejection of privacy-in-principle is "the only tenable position for radical behaviorism" (p. 188), he cites three problems with it and concludes that "we cannot assert with certainty that privacy is accidental" (p. 190) or that Skinner's assumption of uniformity is correct. First, he argues, the position that all behavior can be observed

through instrumental invasion or amplification is an article of faith. I prefer the less pejorative term *assumption*. As noted above, behavior analysis adopts a monistic assumption, from which it follows that behavioral events are physical events. Like all assumptions, it might be wrong, so indeed we can't assert it with certainty. However, if it is wrong, then the problem of privacy is the least of our worries. I am surprised that Baum sees this as a problem and not the sensible foundation on which a science of behavior rests.

Baum's second problem with the position is that in practice, much behavior is inevitably unobserved. But that's not a problem with the position; that *is* the position. Behavior is behavior, whether an observer is on duty or not. Unobserved behavior is inconvenient for the scientist, but observability does not bear on the nature of the behavior itself. If relevant behavior is unobserved, we must make do with plausible interpretations based on the available data.

Baum's third problem arises from his curious urge to find a correspondence between instrumentally amplified instances of "private" behavior and subjects' self-reports. But if instrumental amplification renders a behavior observable, then it is not private, and it has the status of any other observed behavior of the organism. If we observe a person press a lever and then say, "I didn't press the lever," we have two instances of behavior to explain, each with its own history and set of controlling variables. Whether or not we find "correspondence" between the verbal and nonverbal response is itself circumstantial and poses no special problems.

ON APPROPRIATE UNITS OF ANALYSIS

Baum's objections to the claim that privacy is circumstantial are just the

overture to his main point, namely, that the problem of private events goes away if we look at behavior in appropriately extended time windows. The heart of his argument is that

Organisms interact with their environment, and that commerce with the environment is behavior, and its importance lies in its effects on reproductive success via the environment. Organisms produce offspring, feed themselves and offspring, build shelters, avoid predators, and change the world around them in myriad ways. All of these advantageous effects occur through time, on average and in the long run. (p. 193)

This claim attempts to solve the problem of private events by the expedient of defining the subject matter of behavior analysis as behavior that enhances Darwinian fitness, thereby excluding most human behavior, observable or not. Moreover, if we accept that privacy is circumstantial and not an essential property of behavior, the argument simply fails. Whether "all the behavior and effects that matter" (p. 194) are public or private is circumstantial. Watch them and they are public; turn your back, and they are private. All of Robinson Crusoe's behavior, before he encountered Friday, was private in this circumstantial sense, but much of it was extended in time (foraging, building shelter, exploring the island), most of it was commerce with the environment, and it mattered as much as anyone's behavior matters. Thus, private behavior (i.e., unobserved behavior) can take its place in extended time windows as readily as public behavior.

Baum illustrates his point with an example of someone installing a waterfall in his garden. When he encounters a problem (a buried obstacle), he solves it by changing the course of his trench. According to Baum, the momentary details of this performance can be neglected, for they are all part of the extended activity of digging the trench or of the less extended activity of solving the problem. But this is too facile.

Digging a ditch is a relatively homogeneous activity; solving a problem is not. We call something a problem only if the target response is not strong under prevailing conditions, and that's why problem solving cries out for a special explanation. To call the target response "part of an extended activity" of problem solving (p. 194) is to explain nothing. To make the point more clearly, let us suppose that to avoid the obstacle Tom has to calculate the approximate length of the hypotenuse of a triangle with sides of 12 and 7 feet. Why did Tom turn after a diversion of around 14 feet? Why not 5 feet? Why not 50? As in the case of the alphabet puzzle discussed earlier, the ambient public stimuli are not sufficient to explain the variance in Tom's behavior. An inference about private events accounts for this variance without introducing anything mysterious. That is, it serves a standard interpretive function in the face of incomplete or anomalous data.

Note that inferences about private events are not free. As Baum rightly remarks, "we cannot explain observed behavior by simply making stuff up, even if the stuff we are making up is 'just like' the stuff we observe" (p. 191). Private behavioral events are not explanatory wild cards, nor are they equivalent to the "representations" of normative cognitive science. Private behavior cannot be invoked ad hoc, "whenever one runs out of public explanations" (p. 191). It is simply not the case that "private events produce no less specious explanations and have no less mysterious an ontological status than inferred mental events" (p. 191). The distinguishing difference between the behaviorist's appeal to covert behavior and the cognitivist's appeal to the wild card of mental representations is that covert behavior must conform to behavioral principles, whereas mental representations are unconstrained.

That is, any proposed covert behavior must be in one's repertoire (i.e., there must be a relevant history of reinforced responding); its strength must be plausible in the current context (the relevant historical environment must have included critical features that overlap the present environment); it must take time to emit; it must be sensitive to consequences; it must come under stimulus control; it must be stronger than competing behavior; and so on. It would be empty to propose that Tom calculated the length of the hypotenuse of a triangle if, for example, he had no relevant history with the Pythagorean theorem, or if he were loudly reciting *Paradise Lost* all the while he was thought to be performing calculations, or if he had no prior information about the length of the other two sides of the triangle. Simply to invent a covert response for the purpose of resolving a mystery accomplishes nothing if the emission of the response is as mysterious as the original behavior to be explained. But of course that applies to inferences about large-scale, temporally extended behavior as well, if such behavior has chanced to pass unobserved.

Because private behavior simply means unobserved behavior and can be of any magnitude and of any temporal duration, it appears to me that Baum's argument does not apply to private behavior but rather to small-magnitude behavior, public or private, whose commerce with the environment under normal conditions is brief, light, or even undetectable. As a general rule, the smaller the magnitude of the response, the more restricted will be its effects on the environment. But this rule is weak, not least because it is subject to so many exceptions. Many great events are set in motion by small beginnings. In particular, verbal behavior is distinctive in that the magnitude of its effects is often disproportionate to the magnitude

of the response: A whispered command can set an army in motion. It is true that verbal behavior has no such effects unless heard by a listener, but as Skinner (1957) has noted, the speaker can be his own listener. One can engage in covert problem-solving behavior and act on the solution to the problem, possibly with great effects. If the problem-solving behavior were overt, we would not hesitate to identify it as an important variable, and it is no less important if it recedes to a level that it is only effective to an audience of one. In short, as long as circumstantially private events—that is, real, physical events—play a role in determining other physical events, they are a worthy object of scientific inquiry.

As for the relative importance of behavior, I concede that one cannot kill a mastodon with small-magnitude behavior, but small-magnitude behavior may play a role in the invention of a spear with which the kill is effected. In such cases, Baum seems to endorse the claim of Rachlin (1994, 2003) that mental events “may be identified with the public activities from which they are inferred” (p. 195). Tom’s cogitations as he digs his ditch are part of the extended activity of ditch digging and can be subsumed by it. If I am extending this argument correctly, I gather that Baum would say that all of the small-scale local events that went into the invention of the spear can be considered part of the extended spear-invention activity. Deciding on units of analysis is a pragmatic exercise, and if Baum can formulate a comprehensive theory of behavior by defining behavior in this way, then I have no complaint, but I don’t believe he can. Inventing a weapon and solving a chess problem are done just once; they are not repeated activities, so they do not hang together as orderly units like making pancakes or knitting socks. By what criteria will he decide where one

unique activity ends and another unique activity begins? For many practical purposes, we can neglect small-scale events, but to exalt that neglect to a universal principle is unjustified. We cannot account for variance in behavior without considering all relevant controlling variables. Events play exactly the same role in causal chains whether they are observed or not, whether they are private or public. Nothing is to be gained by ignoring them, and much may be lost.

In summary, I believe that for any monist, there is no such thing as privacy in principle; rather, all private events are circumstantially private. However, Baum’s arguments apply to privacy in principle, not to circumstantial privacy. His argument can be rescued by applying it, not to circumstantially private events in general, but only to those of low amplitude, but it is easy to think of exceptions to the proposed rule that such behavior is unimportant. It is inconvenient for a science when its subject matter is difficult to observe, but that subject matter cannot be made to go away by ignoring it. Practice in normative science, when faced with phenomena that are not amenable to experimental analysis, is to engage in scientific interpretation, that is, to offer plausible accounts that appeal only to principles or observations established in the laboratory. That is its principal use in behavior analysis, and it is an honorable one.

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